# Sony High Definition Video Systems

SONY®

# Sony High Definition Video Systems

*The High Definition Television System first proposed and developed by NHK (Japan Broadcasting Corporation) is rapidly gathering worldwide attention from potential users and experts. This system uses 1125 TV lines/60 fields and contains 5 to 6 times the amount of information provided by current television systems (NTSC, PAL, SECAM).*
*Sony adopted the High Definition Television parameters proposed by NHK, and successfully developed cameras, VTRs, display devices and fiber link units.*
*These constitute the Sony High Definition Video System (HDVS). Picture quality fully matches that of 35mm motion picture film in respect of color fidelity and picture clarity.*
*With telecine equipment, tape-to-film recorders and special effects generators added to this existing system, the HDVS will develop into high-quality image creation systems.*

## Experimental Production with HDVS

1, 2 Production of "Double Suicide" by Francis Ford Coppola (Zoetrope Studio) in Los Angeles
3, 4 Production of "American Football" by CBS in Anaheim, California
5, 6 Production of "Fall Guy" by Glen Larson Productions

The Sony HDVS currently consists of the following five kinds of units:

- HD Camera
- HD VTR/TBC
- HD Video Projector
- HD Color Monitors
- HD Optical Fiber Link

These are operated on an R.G.B., three-channel component signal system as outlined at right.

| | |
|---|---|
| Number of scanning lines | 1125 |
| Field-repetition frequency | 60Hz |
| Line-interlace ratio | 1 : 2 |
| Aspect ratio | 3 : 5 |
| Video frequency bandwidth | 30MHz |

## HD CAMERA

System: 1 inch R.G.B. 3-tube system
Pick up tube
- Size: 1 inch
- Target layer: SATICON™
- Deflection system: Static
- Focus system: Magnetic
- Target lead: Pin lead of face plate
- Mesh voltage: 510V

Optical system: R.G.B. Beam splitter, F1.4
Registration: Zone 1: 0.025%
Zone 2: 0.05%
Zone 3: 0.1%
Resolution: 1200 TV lines
Zoom lens: F1.6, 12.5 ~ 175mm/(×14) with extender (×2)
Sensitivity: F4/3200°K 2200 Lux (89.9% Ref)
Viewfinder: 7 inch CRT

## HD VTR/TBC

VTR
VIDEO PERFORMANCE
- Signal system: Y, U, V component
- Recording system: FM recording
- Bandwidth: Luminance: 22MHz
  Chrominance: 10MHz
- Tape width: 1 inch
- Recording time: Max. 48 min.
  (Using SONY V-16-96 or equivalent)
- Tape speed: 48cm/sec.

AUDIO PERFORMANCE
- Bandwidth: 50Hz ~ 15kHz ±1.0dB
- Signal-to-noise ratio: More than 58dB
- Distortion: Less than 1%
- Wow & flutter: Less than 0.08%

EDITING FUNCTIONS
- Insert/Assemble/Preview/Review/Preroll
  (Auto edit capability with two VTRs)

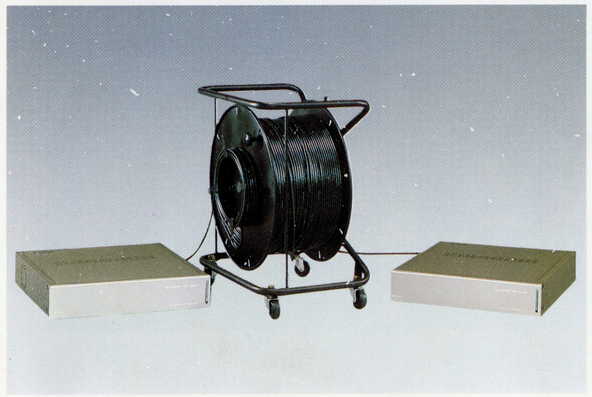
TBC
- A/D converter: 8-bit, 49.1 MSPS
- Window: ±2H
- Signal system: Y, U, V component

## HD VIDEO PROJECTOR

| | |
|---|---|
| Picture tube: | 9 inch CRT × 3 (R.G.B.) |
| Deflection angle: | 70° |
| Anode voltage: | 29kV |
| Screen size: | 2000 × 1200mm (w/h) |
| Screen gain: | 12 |
| Screen brightness: | 25ft-L (max.) |
| Contrast ratio: | 40 : 1 |
| Lens (×3): | F1.6, f = 170mm |
| Video bandwidth: | 30MHz −1dB |
| Registration: | 0.5mm (at center)<br>1.5mm (at corners) |
| Resolution: | 800 TV lines |
| Sync system: | INT/EXT switchable |
| Video input: | Two R.G.B. channels |

## HD COLOR MONITORS

| | 17'' | 24'' |
|---|---|---|
| Picture tube | Fine Pitch Trinitron tube | Fine Pitch Trinitron tube |
| Deflection angle | 90° | |
| Pitch of aperture grille | 300μm | 400μm |
| Number of RGB trio | 1265 | 1371 (1 : 1.85) |
| Video bandwidth | 30MHz (−1dB)<br>50MHz (−3dB) | 30MHz (−1dB)<br>50MHz (−3dB) |
| Brightness | More than 40ft-L | More than 40ft-L |
| Geometric distortion | Less than 1.0% | Less than 1.0% |
| Digital convergence system | Less than 0.5mm | Less than 0.4mm |
| Scanning mode | Over scan/Under scan<br>H-delay, V-delay | |
| Sync system | INT/EXT | |
| Video input | Two R.G.B. channels | Two R.G.B. channels |



## HD OPTICAL FIBER LINK

| | |
|---|---|
| Frequency response: | 10Hz to 30MHz ±0.5dB<br>40MHz −3dB |
| Transmission cable length: | 1km (at S/N 50dB) |
| S/N: | Up to 50dB (30MHz band) |
| SYNC system: | INT/EXT switchable |
| Level stability: | ±0.1dB |
| Time difference R.G.B. | <5ns |
| Delay distortion: | ±5ns at 30MHz |
| Fiber cable: | New light weight (25kg/500m) and space-saving (6mmø) optical multi-fiber cable (5 fibers) |
| Fiber connector: | New low-loss optical fiber multi-connector (5 contacts) |

# Picture Quality Comparison

## HDVS

1125 lines/60 fields : Direct photo from TV monitor screen

## NTSC

525 lines/60 fields : Direct photo from TV monitor screen

35mm MOTION PICTURE FILM

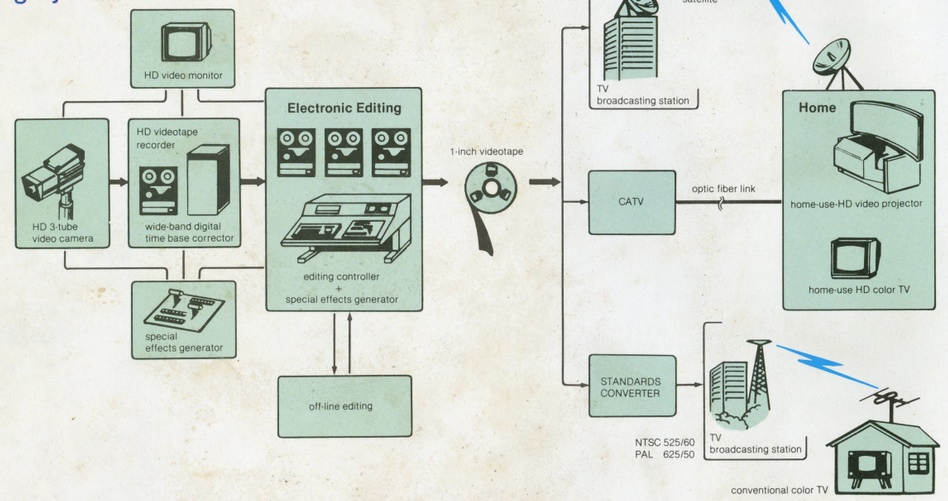
16mm MOTION PICTURE FILM

# Sony HDVS Applicatic

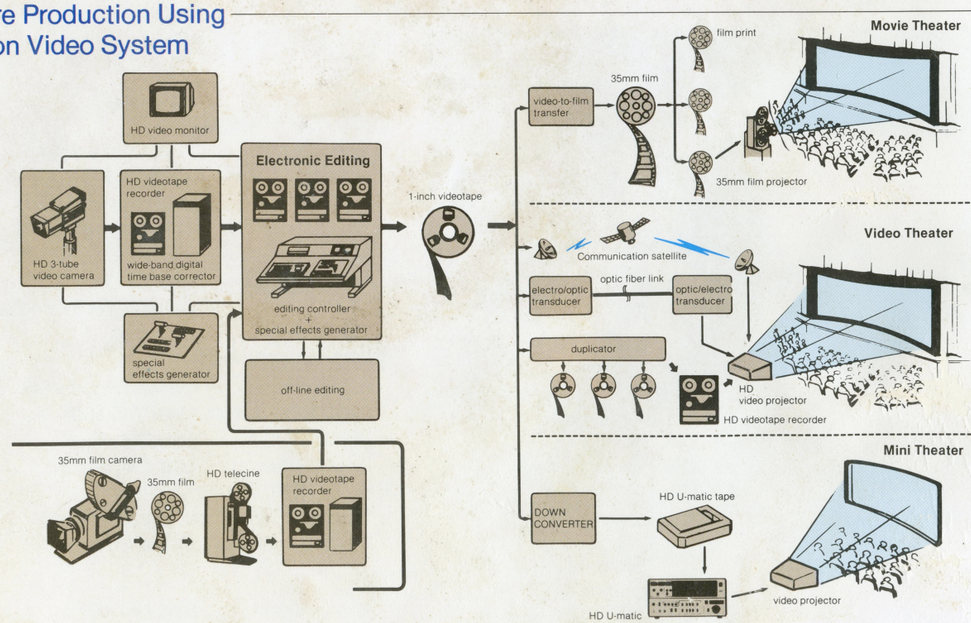
HDVS is envisioned to be a future television broadcast standard as well as a system for a variety of oth applications. Many of these applications may come into use before changes in television broadcasting make high definition broadcasting a reality. Some examples of HDVS applications:

- TV Broadcasting
- Motion picture production
- Motion picture distribution and projection
- Graphic applications in printing
- Visual data storage and document retrieval systems
- Other closed circuit applications, such as medical, surveillance, office automation

## High Definition TV Broadcasting System




## Motion Picture Production Using High Definition Video System

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